AMENDMENTS

In the Claims:

Claims 1-36 (Cancelled).

37. **(Currently Amended)** A method of modulating fluid flow along a flow path of a micro-fluidic device, said method comprising: modulating the physical state of a micro-valve positioned in said flow path, wherein said micro-valve comprises a phase reversible material stably associated with a high surface area component**, and both of said phase reversible material and said high surface area component are present in said flow path**.

38. (Original) The method according to claim 37, wherein said phase reversible material is a phase reversible polymer.

39. (Original) The method according to claim 38, wherein said phase reversible polymer is a thermoreversible polymer.

40. (Original) The method according to claim 37, wherein said modulating comprises changing the temperature of said thermoreversible polymer.

41. (Original) The method according to claim 37, wherein said modulating occurs by actuation of a phase reversing means.

42. (Original) The method according to claim 41, wherein said phase reversing means is completely external to said device.

43. (Original) The method according to claim 41, wherein at least one component of said phase reversing means is internal to said device.

Claims 44 -45 (Cancelled)

46. (Previously Presented) The method according to claim 37, wherein said phase reversible material goes from a first permeable state to a second impermeable state.

47. (Previously Presented) The method according to claim 37, wherein said device comprises two intersecting flow paths.

48. (Cancelled)

49. (Previously Presented) The method according to claim 37, wherein said high surface area component is stably associated with at least one wall of said fluid flow path.

50. (Previously Presented) The method according to claim 37, wherein said high surface area component is maintained in said flow path by a retaining means.

51. (Previously Presented) The method according to claim 37, wherein said high surface area component comprises an array of posts bonded to said at least one surface of said flow path.

52. (Previously Presented) The method according to claim 37, wherein said micro-fluidic device comprises at least one micro-compartment.

53. (Previously Presented) The method according to claim 52, wherein said micro-compartment is a micro-channel.

54. (Previously Presented) The method according to claim 38, wherein said phase reversible polymer is an N-isopropylacrylamide copolymer.

55. (Previously Presented) The method according to claim 38, wherein said phase reversible polymer is a polyalkylene oxide.

56. **(Currently Amended)** A method of modulating fluid flow along a flow path of a micro-fluidic device, said method comprising: modulating the physical state of a micro-valve positioned in said flow path, wherein said micro-valve comprises a phase reversible material stably associated with said microvalve and said phase reversible material goes from a first permeable state to a second impermeable state**, and both of said phase reversible material and said high surface area component are present in said flow path**.

57. (Previously Presented) The method according to claim 56, wherein said phase reversible material is a phase reversible polymer.

58. (Previously Presented) The method according to claim 57, wherein said phase reversible polymer is a thermoreversible polymer.

59 (Previously Presented) The method according to claim 57, wherein said phase reversible polymer is an N-isopropylacrylamide copolymer.

60 (Previously Presented) The method according to claim 57, wherein said phase reversible polymer is a polyalkylene oxide.

61. (Previously Presented) The method according to claim 57, wherein said modulating comprises changing the temperature of said thermoreversible polymer.

62. (Previously Presented) The method according to claim 57, wherein said modulating occurs by actuation of a phase reversing means.

63. (Previously Presented) The method according to claim 62, wherein said phase reversing means is completely external to said device.

64. (Previously Presented) The method according to claim 62, wherein at least one component of said phase reversing means is internal to said device.

65. (Previously Presented) The method according to claim 57, wherein

said device comprises two intersecting flow paths.

66. (Previously Presented) The method according to claim 57, wherein said micro-valve comprises said phase reversible material stably associated with a high surface area component.

67. (Previously Presented) The method according to claim 57, wherein said micro-valve comprises said phase reversible material stably associated with a high surface area component.

68. (Previously Presented) The method according to claim 67, wherein said high surface area component is stably associated with at least one wall of said fluid flow path.

69. (Previously Presented) The method according to claim 67, wherein said high surface area component is maintained in said flow path by a retaining means.

70. (Previously Presented) The method according to claim 67, wherein said high surface area component comprises an array of posts bonded to said at least one surface of said flow path.

71. (Previously Presented) The method according to claim 57, wherein said micro-fluidic device comprises at least one micro-compartment.

72. (Previously Presented) The method according to claim 71, wherein said micro-compartment is a micro-channel.

73. (New) The method according to claim 37, wherein said phase reversible material is covalently bonded to said high surface area component.

74. (New) The method according to claim 37, wherein said microvalve occupies a length of said flow path that is at least about 50 μm long.

75. (New) The method according to claim 37, wherein said high surface area component comprises a mechanical element.

76. (New) The method according to claim 37, wherein said mechanical element of said high surface area component is a rod or a pin.

77. (New) The method according to claim 53, wherein said microchannel has a cross-sectional dimension of from about 10 to 250 μm.